POLLUTION PREVENTION FOR DRY CLEANERS

This booklet provides information about environmental issues and is produced by the Miami-Dade County Department of Environmental Resources Management.

MIAMI-DADE
ERM
DEPARTMENT OF ENVIRONMENTAL RESOURCES MANAGEMENT

Office of Sustainable Environment & Education
33 S.W. 2nd Avenue
Miami, Florida 33130-1540

Pollution Prevention for Dry Cleaners

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This document is published to help educate businesses and individuals on some of the environmental issues affecting them. It suggests options that may help businesses operate in an environmentally appropriate manner. These options are based on experience and simple common sense ideas. Many of the options go beyond what is required to remain in compliance with the regulations. Please refer to Chapter 24 of the Miami-Dade County Code ("Miami-Dade County Environmental Protection Ordinance") and Chapter 62 of the Florida Administrative Code for specific regulations.

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Contact Phone Numbers

MIAMI-DADE COUNTY

Department of Environmental Resources Management
33 S.W. 2nd Avenue, Miami, FL 33130-1540
Online at "http://www.co.miami-dade.fl.us/derm"

Main Switchboard	(305) 372-6789
Air Quality Management Division *(asbestos, refrigerant recovery, air emissions)*	(305) 372-6925
Industrial Facilities Section *(operating procedures, waste handling)*	(305) 372-6600
Liquid Waste Transporters *(lists of waste oil or hazardous waste haulers)*	(305) 372-6804
Pollution Prevention (P2) Program *(p2 information, waste assessments)*	(305) 372-6784
Storage Tank Permitting Section *(storage tank permits)*	(305) 372-6716
Wastewater Section *(sanitary sewer standards)*	(305) 372-6500

Department of Solid Waste Management
8675 N.W. 53 Street, Miami, FL 33166

Main Switchboard	(305) 592-1776
Recycling Hotline	(305) 594-1500
South Dade Landfill *(*24000 S.W. 97 Ave)	(305) 258-2830

STATE OF FLORIDA

Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road, Tallahassee, FL 32399-2400

Main Switchboard	(850) 488-0300
Bureau of Waste Planning and Regulation *(EPA hazardous waste permit)*	(850) 487-3299
Pollution Prevention Program	(850) 488-0300
Southeast Region Office (Main Switchboard)	(561) 681-6600
Emergency State Warning Point	1-800-320-0519

UNITED STATES

Environmental Protection Agency

Region IV , Atlanta, GA	(770) 347-3016
Small Business Assistance Ombudsman	1-800-368-5888
Waste Reduction Resource Center *(waste reduction information clearinghouse)*	1-800-476-8686

- Response actions to abate the source of any spill.
- Third party liability insurance.

- In the event of a spill the fund will act as an "insurance policy" and assist in paying a percentage of the clean-up costs, if the site meets certain eligibility requirements.
- Eligible contaminated sites will be scored by an FDEP system for determining site clean-up priority.
- For more information, please contact the Bureau of Waste Cleanup, State of Florida Department of Environmental Protection Ph: (850) 488-019 or S.E. District Office Ph: (407) 433-2650.

An Alternative to Dry-Cleaning Chemicals

Multi-Process Wet Cleaning is a new approach to cleaning that does not use dry-cleaning solvents and does not damage the fabrics. The process requires better sorting of items based on fabric type and condition. Then the controlled application of heat, steam and natural soaps is used.

- Cleaning options can include:
  - Concentrated cleaning for heavily soiled garments, with a concentrated cleaning solution and a brush.
  - Extensive steaming, spotting and tumble drying.
  - Gentle handwashing of washable fabrics, followed by drip drying.
  - Tumble drying only for unstained garments that simply need to be freshened.
  - Retain a small amount of dry-cleaning for select conditions.
- It has been demonstrated that although multi-process wet cleaning is more labor intensive, the higher labor costs are offset by lower costs for equipment and supplies. However, facilities would have to convert fully to multiprocess cleaning, or ensure that whatever equipment they retained for dry cleaning was fully utilized, in order to be economical.
- Performance ratings, based on customer satisfaction, were found to be equal to or better than the dry cleaning process, over the short term periods of the tests.
- Contact the Pollution Prevention Program for more information. See p. 23 for contact information.

Printed on  *paper*

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Why Should I Read This Booklet?

It's written for you!

Special efforts have been made to produce a booklet that is informative and easy to read. Although there is a great amount of information included, it is presented in a clear and understandable format.

It's the law

As a business owner, operator, or employee, you are responsible for complying with many federal, state, and local regulations. This booklet can help you to comply with those regulations.

It's your money

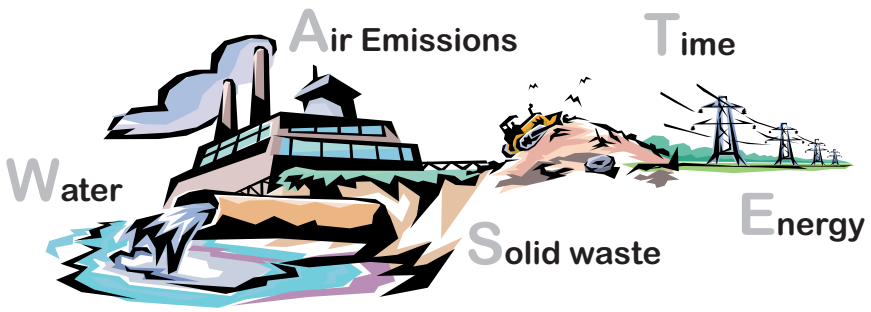
The proper handling and disposal of wastes can be expensive. Furthermore, the improper handling or disposal can lead to even more expensive clean-up costs and fines. By reducing the amount of waste that your business generates, some of these costs can be avoided.

It's our environment

We all breathe the same air, drink the same water, and walk on the same land. When we pollute the environment we are only hurting ourselves and our children.

Wastes Are Important

Wastes can be found in many different forms. Although we are especially concerned with those wastes that are toxic, all wastes should be reduced or eliminated when possible. Anything that does not leave your business as a product or service is a waste. What types of wastes are at your facility?



Hazardous Wastes

A waste is considered a ***hazardous waste*** if:

1) It has any one or more of the following characteristics:

Ignitable (D001)
Ignitable wastes are easily combustible or flammable. They have a flashpoint of less than 140°F or an alcohol content of 24% or more. *(The flashpoint is the lowest temperature at which the vapor of a combustible liquid can be made to ignite in air.)*

Corrosive (D002)
Corrosive wastes are liquids that dissolve metals and other materials, or that burn the skin. They have a pH of 2 or lower, or 12.5 or higher.

Reactive (D003)
Reactive wastes are unstable and react rapidly or violently to shock, heat, or pressure, or when mixed with water or other materials.

Toxic (D004)
Toxic wastes generally have adverse health effects. They need only contain a small amount of a certain material such as heavy metals or toxic organics.

What If You Have an Accidental Spill?

You should always have a Spill Response Plan prepared that identifies the specific steps when a spill occurs at your facility. In case you haven't done that yet, here are some first steps if you have an accidental spill (of "perc"):

- Identify what has caused the leak or spill and take steps to stop and contain any leaks. This can include:
  - Temporarily repair, bypass, or plug the leaking component.
  - Place an empty bucket, drum or container under the leak.
  - Place a leaking container into a larger secure container.
  - Pump the contents of a leaking container into a secure one.
  - Construct a temporary dike or containment area.
  - Construct channels to direct a spill to a containment area.
- Immediately begin clean-up procedures. You can use your supply of absorbent cotton blankets which should be kept in a nearby container to absorb the spills. Place these wet blankets in a functioning dry-cleaning machine immediately, and then clean and dry the blankets to recover the solvent. Any other absorbent materials which are used to clean up the spill must be disposed of properly as a hazardous waste.
- Follow any required procedures for permanent repair and documentation. (See p.16 "Equipment Leaks".)
- Notify the appropriate D.E.R.M. Section (Hazardous Waste, Wastewater) and continue clean-up procedures. Florida requires that a discharge of 1 quart or more of dry cleaning solvent be reported to the State Warning Point at (850) 413-9911.
- Take steps to prevent this from occurring in the future.

Dry-Cleaning Solvent Clean-up Program

Florida has established a program to assist dry-cleaners in the restoration of potable water supplies that have been contaminated by perchloroethylene.

- Some general program responsibilities are:
  - Application and registration.
  - Annual funding for the program through a gross receipt sales tax, a tax on perchloroethylene sales, and registration fees.
  - Secondary containment for all machines and storage containers.
  - Discharge notification for spills of 1 quart or more.

Boilers

Boilers are often used to generate steam for a variety of applications by dry cleaners.

- No boiler "blowdown" should be discharged to the ground. "Blowdown" should be disposed of to sanitary sewers or by another approved method. Contact the Wastewater Section for the sanitary sewer standards. (See p.23 for contact information.)
- All boiler liquid fuel tanks are required to have secondary containment to prevent accidental discharge of fuel to the floor or ground. (See p. 7 "Storage Tanks" and p.23 "Hazardous Facilities Section" for contact information.)
- Optimize boiler size and loading.
- Analyze flue gas and adjust and optimize the air-to-fuel ratio.
- Establish a burner maintenance schedule.
- Install reliable stack dampers.
- Minimize the need for boiler blowdown by using better feed water treatment.
- Recover waste heat from flue gas or blowdown to preheat combustion air or preheat feedwater.

Steam Systems

- Design steam systems so that the end-use is as close as possible to the point of generation. (i.e. shorter lines.)
- Install correctly sized steam traps and implement a steam trap maintenance program.
- Improve insulation of steam lines and condensate lines and tanks.
- Periodically clean steam coils used in process applications.
- Use the minimum steam operating pressure.
- Close off any unused steam lines.

<u>OR</u> 2) It is listed as a hazardous waste in the Code of Federal Regulations, 40 CFR Part 261. This list is very long and may include chemicals that you use daily. If you are unsure, it is suggested that you refer to the list cited and have your waste tested by a laboratory.

Handling and Disposal of Hazardous Wastes

The proper handling of hazardous wastes is very important in order to ensure the health and safety of the public and to protect the environment. Some important things to remember are:

- Never pour waste fluids on open ground, in storm drains, or down shop drains.
- Never mix hazardous and non-hazardous wastes. Even a little hazardous waste can make the entire mixture hazardous and more expensive to dispose of properly.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and the accumulation of rainwater on the top of drums.
- If a container leaks, transfer all of the waste to a new container.
- Keep lids on, and containers closed, when not in use.
- Use funnels when pouring liquids.
- Use containers that are compatible with the waste being stored.
- Don't mix different or incompatible wastes in the same container.

Labels

Proper labeling can reduce accidents and ensure proper disposal.

This label shows some of the information that should be included.

HAZARDOUS WASTE
(or NON-HAZARDOUS WASTE)
FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

If found, please contact the nearest police or public safety authority or the U.S. EPA.

<type of waste>

<your business' name and address and manifest document number>

<accumulation start date>
(the date when waste was first put in the drum)

<federal waste code numbers>

Waste Storage Areas

- Try to store all hazardous wastes in a single area but do not store incompatible items beside each other.
- Identify waste storage area with appropriate signs.
- Satellite collection points are allowed for work-in-progress, but containers should remain covered when not actively in use and be moved to the main storage area once filled or not in use.
- Secondary containment should be provided that is able to contain at least 110% of the largest container's capacity in case of leaks, spills, or punctures. It must have an impermeable (sealed with compatible coating) surface and should be under cover, preferably indoors. Plan approval may be needed.
- Ensure that there is sufficient aisle space between drums to allow complete inspection for proper labeling and any leaks or damage.
- *Check with the Fire Department for their requirements.*

Transportation and Disposal

- Hazardous wastes must be shipped out by an EPA and DERM permitted hauler to an EPA approved treatment, storage, and disposal facility. (See p. 23 for contact information.)
- Use reputable permitted companies for transport and disposal. You are forever liable for any hazardous waste that you generate; a "cradle-to-grave" liability. Even if you have proper documentation, you may still be a potentially responsible party to a clean-up if your waste contributes to the contamination of the environment.

Inspections and Record Keeping

- Any facility generating a hazardous waste should obtain an EPA identification number. (See p.23 for contact information.)
- Keep all records of hazardous wastes handled on-site for at least three (3) years. This includes manifests and any other records documenting amounts stored, reused, or hauled away for disposal.
- Keep records of lab tests for at least three (3) years.
- Keep land disposal restriction forms for at least five (5) years.
- Inspect storage containers and areas for leaks or damage at least once per week and maintain a written log on-site for at least three (3) years. (See p.12-13 for specific source category requirements.)
- Keep any training records for at least three (3) years.

- Water separators used in condensers, carbon adsorbers, cartridge strippers, stills, and muck cookers.
- Wash water from the laundering of industrial rags or garments.
- Wash water from laundering with certain spot and stain treatment chemicals.
- Mop water from floor cleaning, especially in the main work areas. (This has recently been identified as a potential source of contamination and should be handled properly. Discharge to ground or sepitic tanks is not allowed.)

- Wastewater containing perchloroethylene can be passed through carbon filters to reduce perchloroethylene levels prior to discharge to sanitary sewers. In Miami-Dade County the sanitary sewer discharge concentration limit for perchloroethylene is 2 ppm. (See p. 23 "Wastewater Section" for contact information.)
- Special review and approval is required for systems that mist or evaporate wastewater that may contain "perc". See p.23 for contact information or call DERM Plan Review at (305) 375-3330.

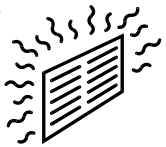
Solid Waste Reduction

Dry cleaners can help to reduce solid waste by working with their customers. They can do this by establishing a system and encouraging their customers to:

- Bring back hangers for reuse.
- Bring back the lightweight plastic garment covers for recycling. (Usually your supplier will take them back to be recycled.)
- Purchase and use heavy duty reusable garment bags when picking up dry cleaning instead of the standard lightweight plastic garment covers.

cartridge. This solvent and water mixture can then be separated and the solvent reclaimed in a distillation unit.

- Determine and maintain the optimal amount of clothes cleaned per standard cartridge before replacement or stripping is necessary.
- Determine and use the optimal steam pressure for stripping cartridges.
- Instead of steam, hot air that is vented to a refrigerated condenser and/or carbon adsorber bed can be used for stripping cartridges. This can help to reduce the amount of wastewater containing "perc" that is generated.



Filter Muck

When dirty solvent is passed through a filter it creates a reusable solvent and filter "muck".

- Filter muck is a RCRA hazardous waste and must be handled and disposed of properly.
- A "muck cooker" can be used to heat the muck material and evaporate any solvent. These vapor emissions are then collected, cooled, condensed and reclaimed for reuse. Any residue must be disposed of properly as a hazardous waste.

Waste Water and Perchloroethylene

Even though water and "perc" will separate if allowed to settle, the "perc" is slightly soluble in water (up to 150 ppm or 0.015 %) at standard conditions. Therefore, the waste water still contains a small amount of "perc". The waste water can be drained off of the top and treated, and the perchloroethylene on the bottom can be collected for reuse.

- Water enters the dry-cleaning process from room humidity, moisture in the fabrics, or water added intentionally to the dry-cleaning solvent in order to increase the cleaning ability.
- Wastewater containing perchloroethylene can come from:

Regulated "Non-Hazardous" Wastes

Although not classified federally as hazardous wastes, there are many materials that are regulated stringently in Miami-Dade County. When in doubt, treat a material as a hazardous waste until you are able to verify that it is not. Always determine what are the correct handling and disposal procedures. Some common examples of these wastes are: used radiator fluid, lubricating oil, transmission fluid, brake fluid, or power steering fluid.

Air Emissions

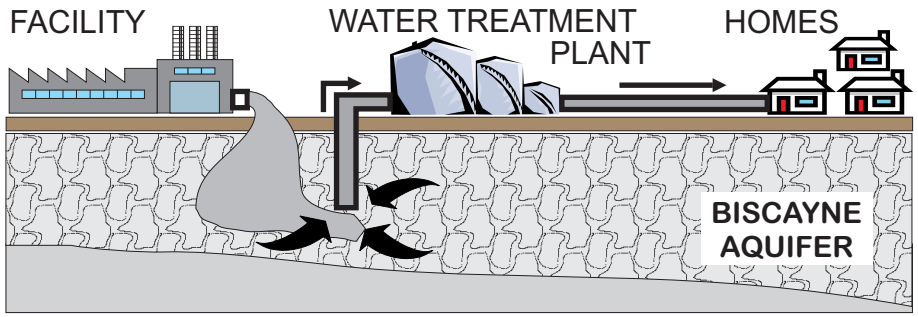
There are many pollutants that are released into the air through evaporation, combustion processes, or otherwise. The release of many of these chemicals is regulated and requires an air permit depending on the quantity released or used. This includes pollutants such as particulates, sulfur dioxide (SO_2), carbon dioxide (CO_2), nitrogen oxides (NOx), chlorofluorocarbons (CFCs), Volatile Organic Compounds (VOCs), and many "Hazardous Air Pollutants" (HAPs). See pp.10-22 for information on specific requirements for dry cleaners.

Hazardous Materials

Although less stringently regulated than hazardous ***wastes***, the proper storage and handling of hazardous ***materials*** is equally important. Many of the storage and handling practices described above for hazardous wastes should, and in some cases must, be applied to hazardous materials as well. This includes certain labeling and spill prevention measures. (See p. 10 for specific virgin "perc" storage requirements.)

Storage Tanks

- Plans must be submitted to DERM and approved prior to installing, modifying, repairing, or removing any storage tank system.
- Most tanks require a current state registration and DERM operating permit.
- Regulated tanks must have an approved leak detection system.
- Ensure that tanks, lines, and dispensers, are constructed of proper corrosion resistant materials.
- Consider removing smaller underground tanks, such as waste oil tanks, and replacing them with above ground storage systems.
- If you have any questions about underground storage tanks please contact DERM's Storage Tanks Section (see p. 23).



In South Florida our drinking water comes from the water that fills the tiny cracks and pores in the rocks just a few feet below us. This water is pumped up to a treatment plant and then out to our homes. That's why we all must be careful not to contaminate the ground or groundwater.

Where Does That Drain Go?

It's important to know what types of drains are at your facility:

Storm Drains

These drains are for ***rain water only***! They are usually found along streets or in parking lots, and discharge directly to a nearby body of water (lake, canal) or allow the water to percolate into the ground. Keep the area around these drains clean and free of spills and debris.

Drains Leading to Septic Tanks

These drains are for ***domestic wastewater only***! Septic tanks allow a short holding time for bacteria to start breaking down domestic waste. From there wastewater goes directly into the ground. Industrial wastewater (even small amounts from washing chemicals off of hands) should never be allowed down these drains because:

1) It can kill the bacteria, often requiring a costly tank pump out.
2) It can directly contaminate our drinking water.
3) It can contaminate your property, requiring expensive clean-ups.

Drains Leading to Sanitary Sewers

These drains are designed primarily for domestic wastewater, but can tolerate very low levels of industrial contaminants. A list of these contaminant levels is available (see p.23 *"sanitary sewer standards"* for contact information). Sanitary sewers are a network of pipes that carry wastewater to a treatment plant and then it is discharged into a nearby body of water (such as miles offshore).

REMEMBER: Never pour flammable solvents into any sewer system. This may cause an environmental and/or fire and explosion hazard.

On-site Distillation

On-site distillation is the primary method used in purifying and recovering dry-cleaning solvents for reuse. Distillation residues or "still bottoms" may contain as much as 50% solvent in addition to any nonvolatile components, such as dirt, detergents, waxes, oils, greases, etc.

- These still bottoms are a RCRA hazardous waste and must be handled and disposed of properly.
- Regularly remove the residues in distillation units to improve their efficiency.
- The addition of steam (water) can enhance distillation, but will also increase the volume of wastewater. The mixture of water with distillation residues can form a "perc"/water azeotrope that boils at a lower temperature than pure perchloroethylene. As a result, the distillation rate increases and the "perc" separates more completely from the non-volatile components.
- To recover more solvent or reduce solvent content in the residue after a first boil-down, add water and redistill the residue. However, this can also increase the volume of wastewater. (See "Waste Water & Perchloroethylene" on p. 18)
- Vents from distillation units can be ducted directly to refrigerated condensers and carbon adsorber beds to minimize vapor emissions, if economically possible.

Cartridge Filters

Cartridge filters with carbon-cores are the most common type of filter used in dry-cleaning.

- Spent cartridge filters are a RCRA hazardous waste and must be handled and disposed of properly.
- Cartridges should be drained for at least 24 hours in a closed container. These cartridges can contain as much as one (1) gallon of solvent.
- Steam can be used to strip and recover additional solvent from the

Reducing Fugitive Emissions

Fugitive emissions can be attributed to a variety of sources including clothing transfer from washer to dryer for transfer-type machines, equipment leaks, open containers, opening of the equipment doors, etc. (See p.12-13 for specific source category requirements.) Here are some tips to help you to reduce fugitive emissions:

- Replace transfer machines with dry-to-dry machines. (For transfer machines, the tumblers or reclaimers may not be replaced. Any machine replacements must be with dry-to-dry machines. Any new sources must use dry-to-dry machines.)
- Room enclosures can be used to reduce fugitive emissions. A room enclosure is a stationary structure enclosing transfer type dry cleaning machines. Air in this room enclosure can then be vented to a carbon adsorber or similar control device. (See p.12-13 for specific source category requirements.)

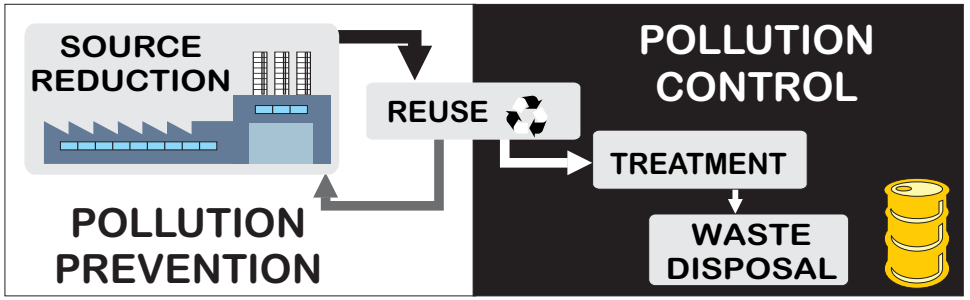
EQUIPMENT LEAKS

Equipment leaks can account for up to 25% of the solvent emissions from dry cleaning operations.

- Leaks can be detected by:
  - The odor of perchloroethylene.
  - Visual observations, such as dripping or puddles of liquid.
  - The detection of a gas flow by passing fingers over the equipment.
  - The use of a halogenated-hydrocarbon detector. This is usually the most accurate, reliable, and quickest method.
- Places to check for leaks include: hose and pipe connections, fittings, couplings, and valves; door gasket seating; filter gaskets and seating; pumps; solvent tanks and containers; water separators; "muck cookers"; distillation units; exhaust dampers; diverter valves; and cartridge filter housings.
- Documentation of regular leak inspections is required.
- If fugitive equipment leaks are detected:
  - Begin the process of repair within 24 hours.
  - If you need parts they should be ordered within two (2) days.
  - Install parts within five (5) days of receipt .
  - Actions taken to repair identified leaks should be documented.

What is Pollution Prevention?

Once you have generated a waste or pollutant your only choice is pollution *control* (treatment and disposal). What if instead, you reduced or eliminated the wastes or pollutants at the source? Then you would be doing pollution ***prevention*** by avoiding the creation of wastes in the first place! This booklet provides information on both pollution ***prevention*** and pollution ***control***.



Benefits of Pollution Prevention

- Reduced operating costs through increased efficiency.
- Reduced risk of liability.
- An improved company image.
- Protection of the public health and the environment.

Implementing Pollution Prevention

Too often things are done a certain way because, "It's always been done that way." Well it's time for a change! DERM is encouraging every business to reduce its waste by implementing a pollution prevention program. Here's how:

- Make a commitment to pollution prevention.
- Encourage employees to participate and make suggestions.
- Evaluate the types and quantities of wastes that are generated.
- Find ways to reduce the amount of waste that is generated.
- Make the changes necessary to reduce wastes.

Many waste reduction options are based on common sense and are inexpensive to implement. This booklet contains some ideas to get you started. Your shop may already be using pollution prevention practices without realizing it. Don't forget, *"An ounce of [pollution] prevention is better than a pound of cure."*

Permits

Most industrial facilities in Miami-Dade County are required to have a permit from DERM. Permits are required for shops performing dry-cleaning. In addition, there may be other permits that are required from DERM and other environmental agencies. Do you have current permits for your activities? (See p.23 for contact information.)

Dry-Cleaning Chemicals

- **Perchloroethylene** (PCE, tetrachloroethylene, or simply "perc") is the most commonly used dry-cleaning solvent.
- **Petroleum solvents** (e.g. Stoddard™, Exxon 2000™, quick-dry, or low-odor) are occasionally used but pose a variety of special problems including flammability. Many new non-chlorinated petroleum solvents are being formulated that are not flammable (Flashpoint > 140°F). Liquid wastes from the use of these substances may be hazardous, but their air emissions often are not. Therefore their air emissions are not regulated as closely as "perc", which is classified as a "Hazardous Air Pollutant." (See p. 11 "M.A.C.T. Standard for Dry Cleaners Using 'Perc'".)
- ***Fluorocarbon 113 or Trichlorotrifluoroethane (Valclene™)*** *is now very rarely used as a dry-cleaning solvent. It has been classified as an Ozone Depleting Substance and phased out of production after January 1, 1996 as mandated by Title VI of the Clean Air Act Amendments of 1990.*
- **Spot cleaners or fabric treatments** are some chemicals that are commonly used by dry cleaners in their process. They may contain hazardous ingredients. This can contaminate the "perc", or any distillation residues, or even rinse water for those facilities that also do conventional laundering of fabrics as well.

"Perc" Storage

- Proper secondary containment is required for storage of any "perc" products of an amount greater than approximately one quarter of a gallon (~32 oz.). This containment must be sealed and compatible with the stored materials. (See p.6 "Waste Storage Areas").

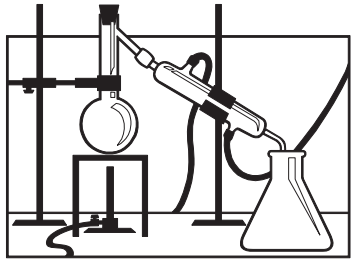
should be equal to or less than 45°F (7°C). Furthermore, a temperature difference of at least 20°F (11°C) between inlet and exhaust is required for "Large Area Sources" and "Major Sources".

- Regular measurement and recording of the exhaust (and inlet) temperatures may be required depending on "perc" consumption.

CARBON ADSORBERS (SNIFFERS)

Carbon adsorbers remove solvent vapors from an air stream by "absorbing" the vapor onto the surfaces of a bed of activated carbon. These carbon beds are then usually regenerated with steam and the resulting steam and solvent mixture can be separated and the solvent distilled for reuse (Refer to p.12-13 for specific source category requirements.)

- Carbon adsorption (sniffer) units can:
  - Handle high air flows with low solvent concentrations.
  - Reduce solvent vapors in exhaust by up to 95%..
- Carbon adsorption (sniffer) units can be used in the following areas:
  - As a secondary add-on control, after refrigerated condensers. These units are used to "clean" the air even further and capture low concentrations of solvents.
  - As a control for fugitive emissions.
- To optimize performance of the carbon adsorber units:
  - Follow manufacturer's recommendations.
  - Determine and maintain the maximum or optimum ratio of clothes cleaned for the quantity of activated carbon used.
  - Determine and maintain the optimum solvent to carbon ratio to ensure that the stripping is done frequently enough.
  - Determine and maintain the optimum air flow rate that is passed through the carbon bed.
  - Determine and maintain the optimum steam pressure used to strip solvents from the carbon bed.
- Regular measurement of the concentration of "perc" in the exhaust from the carbon adsorbers may be required. This can be performed using a colorimetric tube. (The concentration of "perc" in the carbon adsorber exhaust should generally be less than 100 ppm.)



Types of Air Emissions From Dry-Cleaning

There are two general types of air emissions from dry-cleaning:

PROCESS VENT EMISSIONS

These emissions are from air that is vented to the atmosphere after being passed over clothes during the aeration cycle of dry-cleaning.

FUGITIVE EMISSIONS

These emissions are attributed to a variety of "unintentional" sources that are not a basic part of the process.

Reducing Process Vent Emissions of "Perc"

Process vent emissions are a "basic part of the process." In a "vented" dry-cleaning process, fresh air is introduced and passed through the clothes during the drying cycle. (Even non-vented processes do this for the final aeration cycle.) This air is then vented to the atmosphere and can contain significant quantities of solvent. The following sections describe some types of controls for process vent emissions. (See p.12-13 for specific source category requirements.)

NON-VENTED DRY-TO-DRY MACHINES

These machines are designed to reduce process and fugitive emissions as much as possible. They reduce emissions by not venting to the atmosphere, and eliminating the need to transfer between the washer and dryer.

REFRIGERATED CONDENSERS (CHILLERS)

Refrigerated condensers recover solvent vapor emissions by cooling the air stream to a temperature below the solvent's dew point. This causes the solvent (and usually water vapor) to condense into a liquid form. (See p.12-13 for specific source category requirements.)

- Refrigerated condensers can be used in the following areas:
  - On the vapors from the dryer during the drying cycle. This air stream is continually passed through the condenser and back to the dryer.
  - On the air stream from the final aeration cycle.
  - On the air stream received from the washer when the door is opened in transfer type machines.
  - On the air stream at the final exhaust point for the process.
- Generally the exhaust on the outlet side of a refrigerated condenser

Housekeeping & Inventory Control

Keeping your facility clean and organized is important. It reduces accidents and provides a professional environment for employees to work in and customers to see. Here are some ideas:

- Keep your shop clean and your floors dry.
- Only purchase quantities of materials that you can use.
- Mark the purchase date on containers and adopt a "First In - First Out" policy so that older materials are used first.
- Keep all containers closed to prevent evaporation, contamination, and accidental spills.
- Plug drains, seal cracks, and coat floors with "perc" resistant materials in any process and storage areas. This will retard "perc" vapors (that may cool at night and fall to the floor) from penetrating concrete floors or entering drains.
- Have "perc" delivered directly to the machines instead of maintaining "perc" in drums on-site.
- Minimize open transfers of "perc" by piping in connections wherever possible. (e.g. between water separator and "perc" supply tank.)
- Follow an aggressive maintenance and leak detection program. (See p. 16 "Equipment Leaks")

M.A.C.T. Standard for Dry Cleaners Using "Perc"

Title III of the Clean Air Act Amendments of 1990 lists perchloroethylene as one of the 189 chemicals to be regulated as ***Hazardous Air Pollutants*** (HAPs). Facilities using these chemicals will be required to lower their air emission levels to those established in the appropriate ***Maximum Achievable Control Technology*** (M.A.C.T.) standard. The M.A.C.T. standard for dry cleaners using perchloroethylene has been promulgated and is summarized in the following table (see p.12-13). Note that requirements vary depending on volume of "perc" usage (i.e. Small Area, Large Area, or Major Source) and if the facility was in operation prior to Dec. 9, 1991or not (i.e.New or Existing).

SUMMARY OF REQUIREMENTS OF THE PERCHLOROETHYLENE (PCE) DRY-CLEANING MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY (M.A.C.T.) STANDARD

Machine Types at Facility	PCE Consumption(gallons per year)		
Only Dry-to-Dry	<140 gallons	140 - 2,100 gallons	>2,100 gallons
Only Transfer	<200 gallons	200 - 1,800 gallons	>1,800 gallons
Both Dry-to-Dry and Transfer	<140 gallons	140-1,800 gallons	>1,800 gallons
Then you are classified as a	**SMALL AREA Source**	**LARGE AREA Source**	**MAJOR Source**
PROCESS VENT CONTROLS			
at EXISTING Facilities (before Dec. 9, 1991)	-None	-Refrigerated condenser or equivalent -Existing carbon adsorbers can remain	
at NEW Facilities (after Dec.9, 1991)	-Refrigerated condenser or equivalent.		-Refrigerated condenser followed by small adsorber or equivalent.
FUGITIVE CONTROLS			
at EXISTING Facilities (before Dec.9, 1991)	-Conduct biweekly leak detection inspections and repairs. Keep a written log. -Store all PCE solvent & waste in sealed containers.		
	-No room enclosure required.		-Room enclosures.
at NEW Facilities (after Dec.9, 1991)	-Leak detection and repair. -Store all PCE solvent and waste in sealed containers. -No new transfer type machines are allowed.		
MONITORING			
at EXISTING Facilities (before Dec.9, 1991)	-None.	-*Refrigerated condenser (RC):* Measure the temperature at the end of the cycle on the outlet side of the RC on a dry-to-dry machine, dryer, or reclaimer. (Needs to be ≤ 45oF). Measure the inlet and outlet temperature difference of the RC on a washer. (Needs to be ≥20oF). -*Carbon adsorber (CA):* Measure the PCE concentration out of the CA (used for process vent control) with a colorimetric detector tube. (Must be ≤100ppm).	
at NEW Facilities (after Dec. 9, 1991)			
OPERATION / MAINTENANCE			
at NEW & EXISTING Facilities	-Operate and maintain dry cleaning systems according to manufacturer's specification and recommendations.		
RECORD KEEPING			
at NEW & EXISTING Facilities	- Each facility must maintain monthly records of PCE purchases, calculations and results of yearly PCE consumption based on PCE purchase receipts and dated records of all monitoring data and pollution prevention activities. - A written log must be maintained for 1) ALL leak detection inspections and repair reports, 2) ALL calibration data, 3) ALL exhaust dust monitoring data on "perc" concentrations. - These records must be retained for at least 5 years.		
at NEW & EXISTING Facilities	- Each facility must submit an initial report and annual compliance reports. Reports must be certified by a responsible official.		

For a complete listing and explanation of the requirements for each of the source categories please contact the Miami-Dade County DERM Air Section at (305) 372-6925